Science of Nutrition

CREDIT HOURS
3

LEVEL
LOWER

EXAM CODE 259  CATALOG NUMBER SCIx259

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Before You Choose This UExcel Exam

Uses for the Examination

- Excelsior College, the test developer, recommends granting three (3) semester hours of lower-level undergraduate credit to students who receive a letter grade of C or higher on this examination.
- Other colleges and universities also recognize this exam as a basis for granting credit or advanced standing.
- Individual institutions set their own policies for the amount of credit awarded and the minimum acceptable score.

Exam-takers who have applied to Excelsior College should ask their academic advisor where this exam fits within their degree program.

Exam-takers **not enrolled** in an Excelsior College degree program should check with the institution from which they wish to receive credit to determine whether credit will be granted and/or to find out the minimum grade required for credit. Those who intend to enroll at Excelsior College should ask an admissions counselor where this exam fits within their intended degree program.

Examination Length and Scoring

The examination consists of approximately 120 questions, most of which are multiple choice; for samples of all the item types on this exam, see the sample items in the back of this guide. Some items are unscored, pretest items. The pretest items are embedded throughout the exam and are indistinguishable from the scored items. You will have two (2) hours to complete the examination. Your score will be reported as a letter grade.

UExcel Exam Resources

**Excelsior College Bookstore**

The Excelsior College Bookstore offers recommended textbooks and other resources to help you prepare for UExcel exams.

The bookstore is available online at (login required): www.excelsior.edu/bookstore

**UExcel Practice Exams**

The official UExcel practice exams are highly recommended as part of your study plan. Once you register for your UExcel exam, you are eligible to purchase the corresponding practice exam, which can be taken using any computer with a supported Web browser. Each practice exam includes two forms that you may take within a 180-day period.

**Excelsior College Library**

Enrolled Excelsior College students can access millions of authoritative resources online through the Excelsior College Library. Created through our partnership with the Sheridan Libraries of The Johns Hopkins University, the library provides access to journal articles, books, websites, databases, reference services, and many other resources. Special library
pages relate to the nursing degree exams and other selected exams. To access it, visit www.excelsior.edu/library (login is required).

Our library provides:

- 24/7 availability
- The world’s most current authoritative resources
- Help and support from staff librarians

**Online Tutoring**

Excelsior College offers online tutoring through SMARTTHINKING™ to connect with tutors who have been trained in a variety of academic subjects. To access SMARTTHINKING, go to www.excelsior.edu/smarthinking. Once there, you may download a copy of the SMARTTHINKING Student Handbook as a PDF.

**Preparing for UExcel Exams**

**Take Charge of Your Own Learning**

At Excelsior College, independent, self-directed study supported by resources we help you find is not a new concept. We have always stressed to exam takers that they are acting as their own teacher, and that they should spend as much time studying for an exam as they would spend in a classroom and on homework for a corresponding college course in the same subject area.

Begin by studying the content outline contained in this content guide, at its most detailed level. You will see exactly which topics are covered, and where chapters on those topics can be found in the Recommended Resources. You will see exactly where you might need to augment your knowledge or change your approach.

The content outline, along with the Learning Outcomes for this exam and recommended textbooks, will serve as your primary resources.

**How Long Will It Take Me to Study?**

A UExcel exam enables you to show that you’ve learned material comparable to one or more 15-week college-level courses. As an independent learner, you should study and review as much as you would for a college course. For a 3-credit course in a subject they don’t know, most students would be expected to study nine hours per week for 15 weeks, for a total of 135 hours.

**Study Tips**

Become an active user of the resource materials. Aim for understanding rather than memorization. The more active you are when you study, the more likely you will be to retain, understand, and apply the information.

The following techniques are generally considered to be active learning:

- **preview or survey** each chapter
- **highlight or underline text** you believe is important
- **write questions or comments** in the margins
- **practice re-stating content** in your own words
- **relate what you are reading** to the chapter title, section headings, and other organizing elements of the textbook
- **find ways to engage** your eyes, your ears, and your muscles, as well as your brain, in your studies
- **study with a partner or a small group** (if you are an enrolled student, search for partners on MyExcelsior Community)
- **prepare your review notes** as flashcards or create recordings that you can use while commuting or exercising

When you feel confident that you understand a content area, review what you have learned. Take a second look at the material to evaluate your understanding. If you have a study partner, the two of you can review by explaining the content to each other or writing test questions for each other to answer. Review questions from textbook chapters may be helpful for partner or individual study, as well.

**Using UExcel Practice Exams**

We recommend taking the first form of the practice exam when you begin studying, to see how much you already know. After taking the first practice exam, check your performance on each question and find out why your answer was right or wrong. This feedback will help you improve your knowledge of the subject and identify areas of weakness that you should address before taking the exam. Take the second form of the
Preparing for This Exam

Prior Knowledge

No prior knowledge of nutrition is required for this examination; however, students are expected to have a basic understanding of human physiology, biology, and chemistry sufficient to master the cell biology concepts tested.

Using the Content Outline

Each content area in the outline includes (1) the recommended minimum hours of study to devote to that content area and (2) the most important sections of the recommended resources for that area. These annotations are not intended to be comprehensive. You may need to refer to other chapters in the recommended textbooks. Chapter numbers and titles may differ in other editions.

This content outline contains examples of the types of information you should study. Although these examples are numerous, do not assume that everything on the exam will come from these examples. Conversely, do not expect that every detail you study will appear on the exam. Any exam is only a broad sample of all the questions that could be asked about the subject matter.

Using the Sample Questions and Rationales

Each content guide provides sample questions to illustrate those typically found on the exam. These questions are intended to give you an idea of the level of knowledge expected and the way questions are typically phrased. The sample questions do not sample the entire content of the exam and are not intended to serve as an entire practice test.
Recommended Resources for the UExcel Exam in Science of Nutrition

The resources and materials listed below were used by the examination development committee to verify all the questions on the exam. Excelsior College recommends you use these resources as the most appropriate information when ordering textbooks from the college’s bookstore (see page 1 of this content guide). You should allow ample time to obtain resources and to study sufficiently before taking the exam, so plan appropriately and systematically.

A word about textbook editions: Textbook editions listed in the UExcel content guides may not be the same as those listed in the bookstore. Textbook editions may not exactly match up in terms of table of contents and organization, depending upon the edition. However, our team of exam developers checks exam content against every new textbook edition to verify that all subject areas tested in the exam are still adequately available in the study materials. If needed, exam developers will list supplemental resources to ensure that all topics in the exam are still sufficiently covered. Public libraries may have the textbooks you need, or may be able to obtain them for you through interlibrary loan to reduce textbook costs. You may also consider financial aid, if you qualify, to further help defray the steep cost of textbooks. A section on OER has been included in this guide to help you locate additional resources to augment your study.

Textbooks

The following textbook was used by the examination development committee to verify all questions on the exam. These study materials may be purchased from the Excelsior College Bookstore.

www.excelsior.edu/bookstore


Reducing Textbook Costs

Many students know it is less expensive to buy a used textbook, and buying a previous edition is also an option. The Excelsior College bookstore includes a buyback feature and a used book marketplace, as well as the ability to rent digital versions of textbooks for as long as students need them. Students are encouraged to explore these and the many other opportunities available online to help defray textbook costs.

Practice Exam

The Practice Exam is available after you register for this UExcel exam.

A Word About Open Educational Resources

Open educational resources (OER) are educational materials available for study at no cost on the Web. Some OER are available for anyone to access any time. Others, such as Massive Open Online Courses (MOOCs), require sign-up and are only available during certain windows. Please note that some MOOC providers offer certificates of completion or other products or services for a fee. No MOOC or other OER is a complete substitute for the content guide and officially Recommended Resources listed here in this content guide. However, by definition, MOOCs are essentially free of charge and include access to a main body of learning materials that may help you in your learning.

Being an independent learner preparing for credit by exam, you may not need any of the fee-based options that are offered elsewhere online. But if you are looking for a coherent academic course for self-study, lectures on specific topics, or audio or visual materials that fit your learning style better than print materials alone, a MOOC or other type of OER may be your answer. Keep in mind that none of these OER were designed by Excelsior, nor are they guaranteed to match the exam content outlines completely. They are simply another tool available in your study kit.

We highly encourage using the Recommended Resources. In the content outline, you will see that the topics in the exam are referenced to specific portions of recommended textbooks. Using OER alone will not ensure you’ve completely covered the content in the exam, or it may not cover some topics in sufficient-enough depth without the use of the formal, recommended textbooks.

If the OER course you choose does not include a textbook for reference and you do not have significant practical theory-based experience in the field of study, use a college textbook to ensure adequate preparation for the exam, and use the exam’s content outline as a guide.
Combined with comparable college textbooks, OER provides you with a variety of choices in knowledge sources and learning experiences, to enhance your understanding of the subject matter.

**Choosing Open Educational Resources**

Most sites for university-based OER can be searched through [www.ocwconsortium.org](http://www.ocwconsortium.org) and/or [www.oercommons.org](http://www.oercommons.org).

Sites that specialize in Web courses designed by college professors under contract with the website sponsor, rather than in Web versions of existing college courses, include:

- [www.education-portal.com](http://www.education-portal.com)
- [www.opencourselibrary.org](http://www.opencourselibrary.org) (abbreviated as OCL)

We have included specific courses that cover material for one or more UExcel® exams from the sites in the listings above. It’s worth checking these sites frequently to see if new courses have been added that may be more appropriate or may cover an exam topic not currently listed.

In addition, sites like Khan Academy ([www.khanacademy.com](http://www.khanacademy.com)) and iTunes U feature relatively brief lessons on very specific topics rather than full courses. Full courses are also available on iTunes U ([http://www.apple.com/education/ipad/itunes-u/](http://www.apple.com/education/ipad/itunes-u/)). We have chosen a few courses and collections for this listing.

**Other Online Resources**

This section of the OER Guide is provided to allow learners to independently search for resources. Send an e-mail to [OER@excelsior.edu](mailto:OER@excelsior.edu) if you have questions about a resource’s credibility.

**Open Online Textbooks**

- Boundless open textbooks
  - [https://www.boundless.com/open-textbooks/](https://www.boundless.com/open-textbooks/)

- BookBoon

- Flatworld Knowledge
  - [http://catalog.flatworldknowledge.com/#our-catalog](http://catalog.flatworldknowledge.com/#our-catalog)

**College Readiness**

- Khan Academy

- Hippocampus
  - [http://www.hippocampus.org/](http://www.hippocampus.org/)

- Open Course Library

- Study Aids
  - Education Portal
  - Khan Academy
  - Annenberg Learner
    - [http://www.learner.org/](http://www.learner.org/)
  - OpenCourseWare
  - OER Commons
    - [http://www.oercommons.org/](http://www.oercommons.org/)
  - Open Course Library
Content Outline

**General Description of the Examination**

The UExcel Science of Nutrition examination is based on material typically taught in a one-semester lower-level course in nutrition science.

This examination measures knowledge of facts and terminology, an understanding of concepts central to the topics of macronutrients, water and micronutrients, cell biology and physiology of nutrient utilization, and energy balance, and the ability to apply these concepts.

Those beginning to study for this exam should be familiar with concepts generally covered in human physiology, biology, and chemistry.

**Learning Outcomes**

After you have successfully worked your way through the recommended study materials, you should be able to demonstrate the following learning outcomes:

1. Describe the guidelines and principles for planning a healthy diet.
2. Name and explain the functions of the macronutrients and micronutrients.
3. Explain the physiological effects of deficiency and toxicity of dietary nutrients.
4. Outline the processes of nutrient digestion, absorption, transport, and utilization.
5. Demonstrate an understanding of how energy balance contributes to both obesity and physical fitness.
6. Identify the major organ systems, tissues, cells, and intracellular organelles involved in nutrient utilization.
Content Outline

The content outline describes the various areas of the test, similar to the way a syllabus outlines a course. To fully prepare requires self-direction and discipline. Study involves careful reading, reflection, and systematic review.

The major content areas on the Science of Nutrition examination, the percent of the examination, and the hours to devote to each content area are listed below.

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Percent of the Examination</th>
<th>Hours of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Overview of Nutrition</td>
<td>15%</td>
<td>20</td>
</tr>
<tr>
<td>II. Macronutrients</td>
<td>25%</td>
<td>27</td>
</tr>
<tr>
<td>III. Water and Micronutrients</td>
<td>25%</td>
<td>27</td>
</tr>
<tr>
<td>IV. Physiology of Nutrient Utilization</td>
<td>15%</td>
<td>21</td>
</tr>
<tr>
<td>V. Consequences of Energy Balance</td>
<td>20%</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** Occasionally, examples will be listed for a content topic to help clarify that topic. However, the content of the examination is not limited to the specific examples given.

I. Overview of Nutrition

15 PERCENT OF EXAM | 20 HOURS OF STUDY

Ch. 1, An Overview of Nutrition
Ch. 2, Planning a Healthy Diet

A. Introduction
   1. Classification of nutrients
      a. Essential nutrients
      b. Energy yielding nutrients
      c. Organic vs. inorganic nutrients
   2. Science of nutrition
      a. Scientific method
   1) Development of hypotheses
   2) Research design
   b. Types of research studies
      1) Epidemiological
      2) Experimental
   3. Dietary reference intakes (DRIs)
   4. Nutrition assessment, diet, and health
      a. Adequate nutrition
      b. Malnutrition
      c. Chronic diseases
   5. Reliable nutrition information

B. Planning a healthy diet

1. Principles and guidelines
   a. Dietary guidelines for Americans
   b. Nutrient and energy density
2. Diet planning guides
   a. MyPlate
   b. Nutrients of concern
3. Food labels
a. Ingredient list
b. Nutrition facts panel
c. Claims on labels

4. Vegetarian diets

II. Macronutrients

25 PERCENT OF EXAM | 27 HOURS OF STUDY

Ch. 4, The Carbohydrates: Sugars, Starches, and Fibers
Ch. 5, The Lipids: Triglycerides, Phospholipids, and Sterols
Ch. 6, Protein: Amino Acids

A. Carbohydrates
1. Types of carbohydrates
   a. Simple (mono- and disaccharides)
   b. Complex
   c. Fiber
      1) Soluble
      2) Insoluble
2. Food sources and recommended intakes
3. Glucose homeostasis
   a. Type 1 diabetes
   b. Type 2 diabetes
4. Health effects associated with carbohydrates
   a. Obesity
   b. Gastrointestinal health
   c. Dental caries
   d. Lactose intolerance
   e. Alternative sweeteners

B. Lipids
1. Types of lipids
   a. Triglycerides
      1) Glycerol
      2) Fatty acids
      a) Saturated
      b) Unsaturated
   i. Monounsaturated
   ii. Polyunsaturated
      (a) Essential fatty acids
   b. Phospholipids
   c. Sterols
      1) Cholesterol
      2) Phytosterols (plant sterols)
2. Food sources and recommended intakes of lipids
   a. Health effects associated with lipids
   b. Cardiovascular disease
      1) Hydrogenation and trans fatty acids
   c. Obesity
   d. Cancer

C. Proteins
1. Amino acids
   a. Nonessential
   b. Essential
2. Protein turnover
   a. Amino acid pool
   b. Nitrogen balance
3. Functions of proteins
4. Food sources and recommended intakes
   a. Protein quality
   b. Complete proteins
   c. Incomplete and complementary proteins
5. Health effects associated with proteins
   a. Protein energy malnutrition
   b. Protein and amino acid supplementation
6. Animal vs. plant sources
III. Water and Micronutrients

A. Water
1. Properties and importance of water
2. Functions of water in the body
3. Water balance and recommended intake
4. Dehydration

B. Minerals: the inorganic nutrients
1. Dietary requirements, food sources, functions in the body, effects of deficiency and toxicity of minerals
   a. Major minerals
      1) Electrolytes
         a) Sodium
         b) Potassium
         c) Chloride
      2) Other major minerals
         a) Calcium
         b) Phosphorus
         c) Magnesium
         d) Sulfur
   b. Trace minerals
      1) Iron
      2) Zinc
      3) Iodine
      4) Selenium
      5) Copper
      6) Manganese
      7) Fluoride
      8) Chromium
      9) Molybdenum
   c. Common health effects associated with minerals
      1) Hypertension
      2) Osteoporosis
      3) Iron deficiency anemia and hemochromatosis
      4) Iodine deficiency
      5) Fluoride and dental caries
      6) Hyponatremia

C. Vitamins
1. Dietary requirements, food sources, functions in the body, effects of deficiency and toxicity of vitamins
   a. Water-soluble vitamins
      1) B vitamins
         1) Thiamine
         2) Riboflavin
         3) Niacin
         4) Biotin
         5) Pantothenic acid
         6) Vitamin B6
         7) Folate
         8) Vitamin B12
      b. Vitamin C
   b. Fat-soluble vitamins
      a. Vitamin A
      b. Vitamin D
      c. Vitamin E
      d. Vitamin K
   c. Health effects
      a. B-vitamin fortification
      b. Neural tube defects
      c. Pernicious anemia
      d. Vitamin D supplements

D. Antioxidant nutrients and health
E. Vitamin and mineral supplements

25 PERCENT OF EXAM | 27 HOURS OF STUDY

Ch. 10, The Water-Soluble Vitamins: B Vitamins and Vitamin C
Ch. 11, The Fat-Soluble Vitamins: A, D, E, and K
Ch. 12, Water and the Major Minerals
Ch. 13, The Trace Minerals
IV. Cell Biology and Physiology of Nutrient Utilization

15 PERCENT OF EXAM | 21 HOURS OF STUDY

Ch. 3, Digestion, Absorption, and Transport
Ch. 7, Energy Metabolism

A. Digestion
1. Anatomy of the GI tract
2. Muscular action
3. Digestive secretions
4. Nutrient digestion
   a. Carbohydrates
   b. Lipids
   c. Protein
   d. Fiber

B. Absorption
1. Mechanisms of absorption
2. To the bloodstream
   a. Amino acids, di- and tripeptides
   b. Simple carbohydrates
   c. Short and medium chain fatty acids, glycerol
   d. Water-soluble vitamins
   e. Minerals
   f. Water
3. To the lymphatic system
   a. Monoglycerides
   b. Long chain fatty acids
   c. Fat-soluble vitamins
   d. Cholesterol and phospholipids

C. Health and regulation of the GI tract
1. Bacteria
2. Hormones
3. Nerve pathways
4. Health and digestive problems
   a. Diarrhea
   b. Irritable bowel syndrome
   c. Constipation
   d. GERD
   e. Other problems

D. Transport
1. Vascular system
2. Lymphatic system
3. Lipid transport
   a. Lipoproteins

E. Cell anatomy and metabolism
1. Catabolic pathways
   a. Glycolysis
   b. TCA cycle
   c. Electron transport chain
   d. Beta-oxidation
   e. Feasting and fasting
2. Anabolic pathways
   a. Protein synthesis
   b. Gluconeogenesis
   c. Glycogen synthesis
   d. Lipogenesis
3. Alcohol metabolism

F. Excretion
1. Kidneys
2. Bile
3. Intestines
4. Skin
V. Consequences of Energy Balance

20 percent of exam | 27 hours of study

Ch. 8, Energy Balance and Body Composition
Ch. 9, Weight Management: Overweight, Obesity, and Underweight
Ch. 14, Fitness: Physical Activity, Nutrients, and Body Adaptations

A. Energy balance
   1. Influences on energy intake
   2. Components of energy expenditure

B. Body composition
   1. Measurements
      a. BMI
      b. DEXA
      c. Other measures
   2. Fat distribution
      a. Waist circumference

C. Weight management and health implications of over- and underweight
   1. Overweight and obesity
      a. Prevalence
         1) Childhood obesity
      b. Physiology of adipose tissue
      c. Causes of overweight and obesity
         1) Genetics
         2) Environment
      d. Treatments for overweight and obesity
         1) Dietary factors
            a) Eating plans
               (i) Fad diets
            2) Behavior modification
            3) Physical activity
            4) Aggressive treatments
               a) Surgery
               b) Drugs
   2. Underweight
      a. Physiological implications
      b. Treatments
      c. Eating disorders
         1) Anorexia
         2) Bulimia
         3) Binge eating
         4) Female athlete triad
         5) Other disorders

D. Physical fitness
   1. Definition of physical fitness
   2. Benefits of fitness
   3. Types of fitness
   4. Energy systems to support activity
      a. Anaerobic
         1) ATP-CP
         2) Glycolysis
      b. Aerobic
         1) Glycogen utilization
         2) Fat utilization
   5. Nutrients to support activity
      a. Vitamins
      b. Minerals
      c. Fluids and electrolytes
         1) Sports drinks
      d. Dietary patterns
         1) Diets to support activity
         2) Before, during, and after competition foods/meals
      e. Supplements and ergogenic aids
Sample Questions

The sample questions give you an idea of the level of knowledge expected in the exam and how questions are typically phrased. They are not representative of the entire content of the exam and are not intended to serve as a practice test.

Rationales for the questions can be found on pages 14–16 of this guide. In that section, the correct answer is identified and each answer is explained. The number in parentheses at the beginning of each rationale refers to the corresponding section of the content outline. For any questions you answer incorrectly, return to that section of the content outline for further study.

1. Which are consistently reliable sources of nutrition-related information?
   (Select the 2 that apply.)
   1) an unsolicited e-mail
   2) a registered dietician
   3) a famous athlete
   4) the PubMed website
   5) a website selling a product

2. Which of the following is considered an “empty kCal” food?
   1) pizza
   2) bacon
   3) soda
   4) hamburger

3. Which descriptions are accurate about the MyPlate tool?
   (Select the 3 that apply.)
   1) Its recommendations apply only to adults.
   2) The sections of the plate vary in size to show the relative proportion of each food group.
   3) It lists the healthiest choices within each food group.
   4) It reflects five food groups.
   5) It was created by the United States Department of Agriculture.

4. What was the basis for the Food and Drug Administration’s (FDA’s) granting stevia the status of “generally recognized as safe”?
   1) Stevia was used for many years by the indigenous people of South America to sweeten their beverages.
   2) Stevia has an Acceptable Daily Intake (ADI) of 4 mg/kg body weight.
   3) Stevia is a glycoside digested and absorbed normally.
   4) Stevia is 300 times as sweet as pure sucrose.

5. How would consumption of plant sterols affect total blood cholesterol concentration?
   Total blood cholesterol concentration would
   1) remain the same.
   2) decrease.
   3) increase slightly.
   4) increase dramatically.
6. Which hormone is a protein?  
   1) testosterone  
   2) estrogen  
   3) cortisol  
   4) insulin  

7. For which condition is oral rehydration therapy necessary?  
   1) overproduction of aldosterone by adrenal glands  
   2) dehydration due to diarrhea  
   3) protein loss from injury  
   4) glucose loss in diabetes  

8. Which is rich in molybdenum?  
   1) cereals  
   2) butter  
   3) oils  
   4) poultry  

9. Which B vitamin is most likely to be destroyed by food processing?  
   1) pantothenic acid  
   2) niacin  
   3) biotin  
   4) riboflavin  

10. Which segment of the gastrointestinal tract has three muscle layers?  
    1) stomach  
    2) esophagus  
    3) small intestine  
    4) large intestine  

11. Why is high-density lipoprotein (HDL) called the “good” cholesterol?  
    1) HDL cholesterol is metabolized by the muscle.  
    2) HDL inhibits the transport of dietary lipids by chylomicrons.  
    3) HDL interacts with VLDL, causing less fat to be deposited in the fat cell.  
    4) HDL picks up cholesterol from the body’s cells and facilitates its disposal by the liver.  

12. Which substance can be used to make glucose?  
    1) lactate  
    2) fatty acids  
    3) acetyl CoA  
    4) ketogenic amino acids  

13. Which is likely to be the most successful weight-loss strategy?  
    1) taking ephedrine-containing supplements that help with weight loss (about 2 pounds a month)  
    2) combining of steam, sauna bath, and wraps to burn and break up fat  
    3) losing 10 percent of weight within 6 months to one year  
    4) taking FDA-approved drugs for weight loss  

14. During high-intensity exercise, a person depletes which fuel source most significantly?  
    1) glycogen  
    2) fat  
    3) protein  
    4) lactate  

15. Which is least beneficial for replacing fluids for serious endurance athletes during athletic events?  
    1) enhanced water  
    2) energy drink  
    3) sports drink  
    4) plain water
SECTION FOUR

Rationales

1. (IA5)
   1. There is no way to know if this information is reliable or not.
   *2. RDs have college degrees in nutrition and/or dietetics, and are thus qualified to give sound nutritional advice.
   3. Unless the individual has formal, college-level training in nutrition, there is no way for you to know if what they say is factual and based upon valid scientific evidence.
   *4. This is a federal government-sponsored website that contains links to peer-reviewed scientific studies. It is thus a trustworthy source of valid nutrition-related information.
5) When money is involved, one should always be cautious and wary.

2. (IB1b)
   1. Even pizza contains some nutrients (protein, fats, carbohydrates).
   2. Even bacon contains some nutrients (protein, fat).
   *3. Soda is considered an empty calorie food because none of its calories provide any nutrients.
   4. Even a hamburger contains some nutrients (protein, fat).

3. (IB2a)
   1. The MyPlate recommendations apply to children as well as adults.
   *2. Each part of MyPlate is sized differently to reflect the relative proportion each food group contributes to a healthy diet. For example, the vegetable section is slightly larger than the protein section.
   3. MyPlate does not distinguish between the foods that are high or low in nutrient density.
   *4. The four food groups are fruits, grains, vegetables, and protein. A circle to the right represents dairy.
   *5) MyPlate was created by the USDA and is found on the website www.choosemyplate.gov.

4. (IIA4e)
   *1. The fact that stevia has been used for many years without side effects by people in South America was a major reason for granting GRAS status.
   2. The ADI for stevia is not a basis for granting GRAS status.
   3. The fact that stevia is digested and absorbed normally is not a basis for GRAS status.
   4. The sweetness of stevia is not a basis for granting GRAS status.
5. (IIIB2)
1. Plant sterols can significantly decrease blood cholesterol concentration, so it would not remain the same.

*2. Consumption of plant sterols would decrease total blood cholesterol concentration.
3. Plant sterols do not cause blood cholesterol concentration to increase.
4. See 3).

6. (IIC3)
1. Testosterone is made from the lipid cholesterol and is not a protein.
2. Estrogen is made from the lipid cholesterol and is not a protein.
3. Cortisol is a steroid hormone and is not a protein.
*4. Insulin is a small protein made by the pancreas.

7. (IIIA3)
1. Medical intervention is necessary because this condition occurs when there is a kidney tumor. Mere oral rehydration therapy is insufficient.

*2. Oral rehydration therapy is used worldwide to replace fluid lost due to dehydration. It consists of a solution of sugar, salt, and water and is taken by mouth.
3. Oral rehydration therapy does not treat protein loss from injury.
4. Medical intervention is necessary because this occurs when diabetes is uncontrolled. Mere oral rehydration therapy is insufficient.

8. (IIIB1b9)
*1. Molybdenum-rich foods include legumes, breads, other grain products, leafy green vegetables, milk, and liver.
2. See 1).
3. See 1).
4. See 1).

9. (IIIC2a5)
*1. Pantothenic acid is easily destroyed in food processing.
2. Niacin is relatively stable during food processing.
3. Biotin is relatively stable during food processing.
4. Riboflavin is easily destroyed by light, but is relatively stable during food processing.

10. (IVA2)
*1. The stomach has circular, longitudinal, and diagonal muscle layers.
2. The esophagus has circular and longitudinal muscle layers.
3. The small intestine has circular and longitudinal muscle layers.
4. The large intestine has circular and longitudinal muscle layers.

11. (IVD3)
1. HDL cholesterol is not metabolized by the muscle.
2. Inhibition of chylomicron transport of dietary lipids is not a function of HDL.
3. HDL interaction with VLDL does not result in less fat deposition in tissues.
*4. HDL cholesterol is known as “good cholesterol” because it encourages cardiovascular health by participating in reverse cholesterol transport.

12. (IVE2b)
*1. Lactate can be converted to pyruvate, which can be used to make glucose.
2. Fatty acids are oxidized to acetyl CoA which cannot be used to make glucose.
3. Acetyl CoA cannot be used to make glucose.
4. Ketogenic amino acids can be converted to acetyl CoA, which cannot be used to make glucose.

*correct answer
13. (VC1d)
1. This weight loss comes with great risk. These supplements have been implicated in numerous heart attacks and seizures.
2. These gimmicks don’t help with weight loss. They do not melt the fat off the body, although they may dehydrate people so they lose water weight.
3. Successful weight-loss strategies embrace small changes, moderate losses, and reasonable goals. Losing 10 percent of weight within 6 months to one year is the most reasonable strategy.
4. When these drugs are used as part of a long-term comprehensive weight loss program, they can help with modest weight loss; nevertheless, the long-term use of drugs poses risks.

14. (VD4b1)
1. For most people, glycogen stores will be depleted by two hours of intensive activity unless the activity intensity is reduced to allow for more aerobic metabolism.
2. See 1).
3. See 1).
4. See 1).

15. (VD5c1)
1. Enhanced water contains few carbohydrates and electrolytes, but flavors may encourage greater fluid intake.
2. Energy drinks can hinder performance and contain high concentrations of carbohydrates that are not optimal for fluid absorption.
3. Sports drinks deliver fluids as well as carbohydrates and electrolytes in specific concentrations necessary to replenish fluids and nutrients lost during endurance activities.
4. Plain water delivers fluids without any potential harmful additions. While it may not be sufficient alone for an endurance athlete, it is unlikely to cause harm or hinder performance.

*correct answer
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